## Congratulations! You passed!

**TO PASS** 80% or higher

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# Week 1 Quiz

**LATEST SUBMISSION GRADE**

100%

1. The R language is a dialect of which of the following programming languages? **1 / 1 point**

- ○ Lisp
- ○ Fortran
- ○ Scheme
- ◉ S

**Correct**
R is a dialect of the S language which was developed at Bell Labs.

2. The definition of free software consists of four freedoms (freedoms 0 through 3). Which of the following is NOT one of the freedoms that are part of the definition? Select all that apply. **1 / 1 point**

- ☑ The freedom to prevent users from using the software for undesirable purposes.

**Correct**
This is not part of the free software definition. Freedom 0 requires that the users of free software be free to use the software for any purpose.

- ☐ The freedom to study how the program works, and adapt it to your needs.
- ☑ The freedom to restrict access to the source code for the software.

**Correct**
This is not part of the free software definition. Freedoms 1 and 3 require access to the source code.

- ☐ The freedom to run the program, for any purpose.
- ☐ The freedom to improve the program, and release your improvements to the public, so that the whole community benefits.
- ☑ The freedom to sell the software for any price.

**Correct**
This is not part of the free software definition. The free software definition does not mention anything about selling software (although it does not disallow it).

- ☐ The freedom to redistribute copies so you can help your neighbor.

3. In R the following are all atomic data types EXCEPT: (Select all that apply) 1 / 1 point

- [ ] complex
- [x] table

  **Correct**
  'table' is not an atomic data type in R.

- [x] list

  **Correct**
  'list' is not an atomic data type in R.

- [ ] logical
- [ ] character
- [ ] numeric
- [x] array

  **Correct**
  'array' is not an atomic data type in R.

- [x] matrix

  **Correct**
  'matrix' is not an atomic data type in R.

- [ ] integer
- [x] data frame

  **Correct**
  'data frame' is not an atomic data type in R.

4. If I execute the expression x <- 4 in R, what is the class of the object `x' as determined by the `class()' function? 1 / 1 point

- (●) numeric
- ( ) matrix
- ( ) integer
- ( ) real
- ( ) list
- ( ) complex
- ( ) vector

✓ **Correct**

5. What is the class of the object defined by the expression x <- c(4, "a", TRUE)? 1 / 1 point

- ( ) numeric
- ( ) logical
- ( ) integer
- (●) character
- ( ) mixed

✓ **Correct**

The character class is the "lowest common denominator" here and so all elements will be coerced into that class.

6. If I have two vectors x <- c(1,3, 5) and y <- c(3, 2, 10), what is produced by the expression rbind(x, y)? 1 / 1 point

- ○ a 3 by 3 matrix
- ○ a 2 by 2 matrix
- ○ a vector of length 2
- ◉ a matrix with two rows and three columns
- ○ a vector of length 3
- ○ a 3 by 2 matrix

✓ **Correct**

The 'rbind' function treats vectors as if they were rows of a matrix. It then takes those vectors and binds them together row-wise to create a matrix.

7. A key property of vectors in R is that 1 / 1 point

- ○ elements of a vector can only be character or numeric
- ○ elements of a vector can be of different classes
- ◉ elements of a vector all must be of the same class
- ○ the length of a vector must be less than 32,768
- ○ a vector cannot have have attributes like dimensions

✓ **Correct**

8. Suppose I have a list defined as x <- list(2, "a", "b", TRUE). What does x[[2]] give me? Select all that apply. **1 / 1 point**

- [ ] a list containing character vector with the letter "a".
- [x] a character vector containing the letter "a".

  ✓ **Correct**

- [x] a character vector of length 1.

  ✓ **Correct**

- [ ] a list containing a character vector with the elements "a" and "b".
- [ ] a character vector with the elements "a" and "b".

9. Suppose I have a vector x <- 1:4 and a vector y <- 2. What is produced by the expression x + y? **1 / 1 point**

- (•) a numeric vector with elements 3, 4, 5, 6.
- ( ) an integer vector with elements 3, 2, 3, 4.
- ( ) an integer vector with elements 3, 2, 3, 6.
- ( ) a numeric vector with elements 1, 2, 3, 6.
- ( ) a numeric vector with elements 3, 2, 3, 4.
- ( ) a numeric vector with elements 3, 2, 3, 6.

✓ **Correct**

10. Suppose I have a vector x <- c(17, 14, 4, 5, 13, 12, 10) and I want to set all elements of this vector that are greater than 10 to be equal to 4. What R code achieves this? Select all that apply. **1 / 1 point**

- [ ] x[x >= 10] <- 4
- [ ] x[x == 4] > 10
- [ ] x[x > 10] == 4
- [x] x[x >= 11] <- 4

**Correct**
You can create a logical vector with the expression x >= 11 and then use the [ operator to subset the original vector x.

- [ ] x[x < 10] <- 4
- [ ] x[x > 4] <- 10
- [x] x[x > 10] <- 4

**Correct**
You can create a logical vector with the expression x > 10 and then use the [ operator to subset the original vector x.

- [ ] x[x == 10] <- 4

11. Use the Week 1 Quiz Data Set to answer questions 11-20. **1 / 1 point**

In the dataset provided for this Quiz, what are the column names of the dataset?

- (•) Ozone, Solar.R, Wind, Temp, Month, Day
- ( ) Month, Day, Temp, Wind
- ( ) 1, 2, 3, 4, 5, 6
- ( ) Ozone, Solar.R, Wind

**Correct**
You can get the column names of a data frame with the `names()' function.

12. Extract the first 2 rows of the data frame and print them to the console. What does the output look like?

1 / 1 point

```
  Ozone Solar.R Wind Temp Month Day
1     9      24 10.9   71     9  14
2    18     131  8.0   76     9  29
```

```
  Ozone Solar.R Wind Temp Month Day
1    41     190  7.4   67     5   1
2    36     118  8.0   72     5   2
```

```
  Ozone Solar.R Wind Temp Month Day
1     7      NA  6.9   74     5  11
2    35     274 10.3   82     7  17
```

```
  Ozone Solar.R Wind Temp Month Day
1    18     224 13.8   67     9  17
2    NA     258  9.7   81     7  22
```

**Correct**

You can extract the first two rows using the [ operator and an integer sequence to index the rows.

13. How many observations (i.e. rows) are in this data frame?

1 / 1 point

- 160
- 45
- 129
- 153

**Correct**

You can use the `nrows()' function to compute the number of rows in a data frame.

14. Extract the *last* 2 rows of the data frame and print them to the console. What does the output look like?

1 / 1 point

```
    Ozone Solar.R Wind Temp Month Day
152    11      44  9.7   62     5  20
153   108     223  8.0   85     7  25
```

```
    Ozone Solar.R Wind Temp Month Day
152    18     131  8.0   76     9  29
153    20     223 11.5   68     9  30
```

```
    Ozone Solar.R Wind Temp Month Day
152    31     244 10.9   78     8  19
153    29     127  9.7   82     6   7
```

```
    Ozone Solar.R Wind Temp Month Day
152    34     307 12.0   66     5  17
153    13      27 10.3   76     9  18
```

**Correct**

The `tail()' function is an easy way to extract the last few elements of an R object.

15. What is the value of Ozone in the 47th row?

1 / 1 point

- 63
- 34
- 18
- 21

**Correct**

The single bracket [ operator can be used to extract individual rows of a data frame.

16. How many missing values are in the Ozone column of this data frame?

1 / 1 point

- 43
- 78
- 9
- 37

**Correct**

The `is.na' function can be used to test for missing values.

17. What is the mean of the Ozone column in this dataset? Exclude missing values (coded as NA) from this calculation. **1 / 1 point**

- ○ 53.2
- ◉ 42.1
- ○ 18.0
- ○ 31.5

✓ **Correct**
The `mean' function can be used to calculate the mean.

18. Extract the subset of rows of the data frame where Ozone values are above 31 and Temp values are above 90. What is the mean of Solar.R in this subset? **1 / 1 point**

- ○ 185.9
- ○ 205.0
- ○ 334.0
- ◉ 212.8

✓ **Correct**
You need to construct a logical vector in R to match the question's requirements. Then use that logical vector to subset the data frame.

19. What is the mean of "Temp" when "Month" is equal to 6? **1 / 1 point**

- ○ 90.2
- ○ 75.3
- ◉ 79.1
- ○ 85.6

✓ **Correct**

20. What was the maximum ozone value in the month of May (i.e. Month is equal to 5)? **1 / 1 point**

- ○ 97
- ○ 18
- ◉ 115
- ○ 100

✓ **Correct**